



Missouri Department of Natural Resources

Interim Monitoring Plan for 26 Waters

Final decisions regarding water body impairment will be based on the current Strategy Document approved by the Missouri Clean Water Commission (MCWC) in April 2000. Criteria for determination of impairment include Numeric, General and Anti-Degradation Standards. If MDNR determines a water body should be proposed for the next 303d list, it will follow the appropriate and lawful procedure under Missouri Clean Water law and submit the list to the MCWC. The “Applicable Standards” and “Criteria for Compliance with Standards” listed for each stream segment are the concerns MDNR will evaluate with the stated sampling plan.

Some of the 26 waters identified in this monitoring plan had been proposed as additions to the 303d List in 2000. The drafting of the 2000 list was postponed due to pending federal rules that delayed list development until 2002. The remaining waters were not listed in 1998 or 2000, due to lack of credible data to support listing. The monitoring plan would provide additional information on which to base impairment determinations.

DNR will use all available data, as described in the acceptable data section of the Strategy Document, to determine impairments. This includes results of ammonia, pH, water temperature, dissolved oxygen, phosphorus (when a numeric standard is set) and nitrogen (when a numeric standard is set) chemical monitoring, and benthic and visual survey forms, by volunteer monitors with a level 2 or higher QAQC rating.

Stream by stream agreement:

1. Bear Creek – Adair County

- **Water Quality Concern:** Bear Creek was proposed as an addition to the 303d List in 2000. The Missouri Department of Conservation provided data and comments that indicated a significant impairment to the fish fauna in a segment of Bear Creek from above the Kirksville Wastewater Treatment Plant to Route KK. This is an unclassified stream and only General Criteria apply.
- **Applicable Water Quality Standards:** General criteria stating waters shall be free from conditions harmful to aquatic life.
- **Monitoring planned:** DNR will request MDC to perform in 2000 or 2001 a fish community study on Upper Bear Creek and at least one nearby control stream of similar size for the purpose of determining differences in fish community and fish species richness. If statistically significant differences occur, a determination will try to be made if problems are due to urban development, or effects of wastewater treatment plant discharge, both conditions or neither condition.
- **Criteria for Compliance with Standards:** Substantial weight will be given to MDC Fisheries Division staff determinations as to whether there are statistically significant impairments to the fish density and/or diversity of Bear Creek.

2. **Hickory Creek – Daviess County**

- **Water Quality Concern:** Hickory Creek may not be meeting the numeric water quality standards for a limited warm-water fishery due to pollution from animal waste. Another concern is whether it meets the general criteria identified below.
- **Applicable Water Quality Standards:** Numeric criteria for ammonia and dissolved oxygen. General criteria stating waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or unsightly or harmful bottom deposits or floating material.
- **Monitoring Planned:** Numeric Criteria: Several streams in north Missouri below large Confined Animal Feeding Operations (CAFOs) are part of a fixed station monitoring network and are currently being monitored by DNR on a routine basis for ammonia and several other chemical analytes. If the current monitoring is insufficient to characterize ammonia and dissolved oxygen levels, additional monitoring sites will be added to sampling plan. General Criteria: DNR will schedule a visual/benthic low flow survey by DNR in 2000 to assess compliance with general criteria.
- **Criteria for Compliance with Standards:** Chemical Sampling: Numeric Water Quality Standards for ammonia and dissolved oxygen. General Criteria: Opinion of DNR/Water Pollution Control Program (WPCP) staff conducting visual/benthic low flow stream surveys.

3. **Hickory Creek – Grundy County**

- **Water Quality Concern:** Hickory Creek may not be meeting the numeric water quality standards for a limited warm-water fishery due to pollution from animal waste. Another concern is whether it meets the general criteria identified below.
- **Applicable Water Quality Standards:** Numeric criteria for ammonia and dissolved oxygen. General criteria stating waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or unsightly or harmful bottom deposits or floating material.
- **Monitoring planned:** Numeric Criteria: Several streams in north Missouri below large Confined Animal Feeding Operations (CAFOs) are part of a fixed station monitoring network and are currently being monitored by DNR on a routine basis for ammonia and several other chemical analytes. If the current monitoring is insufficient to characterize ammonia and dissolved oxygen levels, additional monitoring sites will be added to sampling plan. General Criteria: DNR will schedule a visual/benthic low flow survey by DNR in 2000 to assess compliance with general criteria.
- **Criteria for Compliance with Standards:** Chemical Sampling: Numeric Water Quality Standards for ammonia and dissolved oxygen. General Criteria: Opinion of DNR/WPCP staff conducting visual/benthic low flow stream surveys.

4. **Raccoon Creek - Grundy County**

- **Water Quality Concern:** Raccoon Creek may not be meeting the numeric water quality standards for a limited warm-water fishery due to pollution from animal waste. Another concern is whether it meets the general criteria identified below.

Note: There was a manure spill to Raccoon Creek from the Scott Farm in June 1996. Another episode of in-stream ammonia levels exceeding the acute ammonia criterion occurred in September 1997. A manure spill from Scott Farm resulted in a fish kill in July 1999. This results in two episodes of significant impairment of the biotic community within a three-year period. DNR now categorizes the lower 4.7 miles of Raccoon Creek as not attaining the Water Quality Standards related to protection of aquatic life. This does not, however, qualify Raccoon Creek for inclusion on the 303(d) list as Scott Farm has an NPDES permit prohibiting spills or discharges. Waterbodies are placed on the 303d List when existing regulations or technology can not address the impairment. It was determined the impairment on Raccoon Creek could be addressed by enforcing the existing permit.

- **Applicable Standards:** Numeric Criteria for ammonia and dissolved oxygen. General criteria stating waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or unsightly or harmful bottom deposits or floating material.
- **Monitoring Planned:** Specific Criteria: Several streams in north Missouri below large Confined Animal Feeding Operations (CAFOs) are part of a fixed station monitoring network and are currently being monitored by DNR on a routine basis for ammonia and several other chemical analytes. If the current monitoring is insufficient to characterize ammonia and dissolved oxygen levels, additional monitoring sites will be added to sampling plan. General Criteria: DNR will schedule a visual/benthic low flow survey in 2000 to assess compliance with general criteria.
- **Criteria for Compliance with Standards:** Chemical Sampling: Numeric Water Quality Standards for ammonia and dissolved oxygen. General Criteria: Opinion of DNR/WPCP staff conducting visual/benthic low flow stream surveys.

5. Indian Creek - Iron County

- **Water Quality Concern:** This waterbody may not be meeting the general criteria for support of aquatic life. Toxicity may be occurring due to metals contamination from lead mining activities, with zinc being the suspected metal of concern. If preliminary data is substantiated, it is anticipated Indian Creek will meet the criteria for 303d listing in 2002.
- **Applicable Standards:** General criteria stating waters shall be free from conditions harmful to aquatic life.
- **Monitoring Planned:** DNR will schedule a study of the aquatic invertebrate fauna of Indian Creek and a nearby control stream of similar size to determine if the density and/or diversity of aquatic invertebrates in Indian Creek has been reduced. Study will be scheduled in 2001.
- **Criteria for Compliance with Standards:** Opinion of DNR staff conducting the invertebrate study that there has been a statistically significant reduction of the density and/or diversity of aquatic invertebrates.

6. East Honey Creek – Mercer County

- **Water Quality Concern:** East Honey Creek may not be meeting the numeric water quality standards for a limited warm-water fishery due to pollution from animal waste. Another concern is whether it meets the general criteria identified below.

- **Applicable Water Quality Standards:** Numeric criteria for ammonia and dissolved oxygen. General criteria stating waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or unsightly or harmful bottom deposits or floating material.
- **Monitoring Planned:** Numeric Criteria: Several streams in north Missouri below large Confined Animal Feeding Operations (CAFOs) are part of a fixed station monitoring network and are currently being monitored by DNR on a routine basis for ammonia and several other chemical analytes. If the current monitoring is insufficient to characterize ammonia and dissolved oxygen levels, additional monitoring sites will be added to sampling plan. General Criteria: DNR will schedule a visual/benthic low flow in 2000 to assess compliance with general criteria survey.
- **Criteria for Compliance with Standards:** Chemical Sampling: Numeric Water Quality Standards for ammonia and dissolved oxygen. General Criteria: Opinion of DNR/WPCP staff conducting visual/benthic low flow stream surveys.

7. **West Honey Creek – Mercer County**

- **Water Quality Concern:** West Honey Creek may not be meeting the numeric water quality standards for a limited warm-water fishery due to pollution from animal waste. Another concern is whether it meets the general criteria identified below.
- **Applicable Water Quality Standards:** Numeric criteria for ammonia and dissolved oxygen. General criteria stating waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or unsightly or harmful bottom deposits or floating material.
- **Monitoring Planned:** Numeric Criteria: Several streams in north Missouri below large Confined Animal Feeding Operations (CAFOs) are part of a fixed station monitoring network and are currently being monitored by DNR on a routine basis for ammonia and several other chemical analytes. If the current monitoring is insufficient to characterize ammonia and dissolved oxygen levels, additional monitoring sites will be added to sampling plan. General Criteria: DNR will schedule a visual/benthic low flow survey in 2000 to assess compliance with general criteria.
- **Criteria for Compliance with Standards:** Chemical Sampling: Numeric Water Quality Standards for ammonia and dissolved oxygen in limited warm-water streams. General Criteria: Opinion of DNR/WPCP staff conducting visual/benthic low flow stream surveys.

8. **Muddy Creek – Mercer County**

- **Water Quality Concern:** Muddy Creek may not be meeting the numeric water quality standards for a limited warm-water fishery due to pollution from animal waste. Another concern is whether it meets the general criteria identified below.
- **Applicable Water Quality Standards:** Numeric criteria for ammonia and dissolved oxygen. General criteria stating waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or unsightly or harmful bottom deposits or floating material.
- **Monitoring Planned:** Numeric Criteria: Several streams in north Missouri below large Confined Animal Feeding Operations (CAFOs) are part of a fixed station monitoring network and are currently being monitored by DNR on a routine basis for

ammonia and several other chemical analytes. If the current monitoring is insufficient to characterize ammonia and dissolved oxygen levels, additional monitoring sites will be added to sampling plan. General Criteria: DNR will schedule a visual/benthic low flow survey in 2000 to assess compliance with general criteria.

- **Criteria for Compliance with Standards:** Chemical Sampling: Numeric Water Quality Standards for ammonia and dissolved oxygen in limited warm-water streams. General Criteria: Opinion of DNR/WPCP staff conducting visual/benthic low flow stream surveys.

9. Hess-Heaths Creeks – Pettis/Cooper Counties

- **Water Quality Concern:** Hess-Heaths Creek may not be meeting the numeric water quality standards for a limited warm-water fishery due to pollution from animal waste. Another concern is whether it meets the general criteria identified below. It is also of concern due to the Endangered Species Act being applicable to this segment.
- **Applicable Water Quality Standards:** Numeric criteria for ammonia and dissolved oxygen. General criteria stating waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or unsightly or harmful bottom deposits or floating material.
- **Monitoring Planned:** Numeric Criteria: Several streams in north Missouri below large Confined Animal Feeding Operations (CAFOs) are part of a fixed station monitoring network and are currently being monitored by DNR on a routine basis for ammonia and several other chemical analytes. If the current monitoring is insufficient to characterize ammonia and dissolved oxygen levels, additional monitoring sites will be added to sampling plan. General Criteria: DNR will schedule a visual/benthic low flow survey in 2000 to assess compliance with general criteria.
- **Criteria for Compliance with Standards:** Chemical Sampling: Numeric Water Quality Standards for ammonia and dissolved oxygen in limited warm-water streams. General Criteria: Opinion of DNR/WPCP staff conducting visual/benthic low flow stream surveys.

10. Long Branch – Pettis/Johnson Counties

- **Water Quality Concern:** Portions of Whiteman Air Force Base runways and Johnson County Egg, a large CAFO, are in this watershed and spills/runoff have resulted in incidents of water quality impairment. DNR has not, however, documented the requisite two occasions of significant impairment within the last three years that would allow classification of this waterbody as impaired. A water quality study of Muddy Creek and tributaries by the Department of Conservation in 1997-98 indicated that average phosphorus, nitrogen and chloride levels were higher in Long Branch than in Muddy Creek just upstream of Long Branch. This finding is consistent with the intensive land use in the Long Branch watershed.
- **Applicable Standards:** All applicable state numeric and general criteria.
- **Monitoring planned:** Numeric Criteria: Muddy Creek downstream of this segment is a DNR fixed station chemical monitoring site. This site monitors for several analytes including water temperature, ammonia, sulfate, chloride and dissolved oxygen, all of which have numeric water quality criteria. General Criteria: DNR will perform a visual/benthic survey of Long Branch in the summer of 2000.

- **Criteria for Compliance with Standards:** Numeric Water Quality Standards for limited warm-water streams. General Criteria: Opinion of DNR/WPCP staff conducting visual/benthic low flow stream surveys.

11. Sewer Branch (Pearl River) – Pettis County

- **Water Quality Concern:** Sewer Branch may not be meeting the numeric water quality standards for a limited warm-water fishery due to pollution by the Sedalia North Wastewater Treatment Plant. Four miles of the stream are of concern and three of the miles are unclassified and only general criteria apply. Concern regarding high bacterial levels also exists. This waterbody does not have a designated use of whole body contact recreation and, therefore, bacterial concerns cannot be addressed as an impairment.
- **Applicable Standards:** All applicable state numeric and general criteria.
- **Monitoring Planned:** Numeric Criteria: DNR will conduct a study of Sewer Branch during low flow conditions, and will monitor the stream for water temperature, dissolved oxygen, ammonia, pH, conductivity and nutrient ions. General Criteria: DNR will also conduct a visual/benthic low flow survey of the stream. These surveys are scheduled for both the summer 2000 and for the summer of 2001.
- **Criteria for Compliance with Standards:** Chemical Sampling: Numeric criteria for limited warm-water streams. General Criteria: Opinion of DNR/WPCP staff conducting visual/benthic low flow stream surveys.

12. Sandy Creek – Putnam County

- **Water Quality Concern:** Sandy Creek may be impacted by animal waste and abandoned mine land (AML) located in the watershed. Available data does not indicate impairment from the AML.
- **Applicable Standards:** Numeric criteria for ammonia, dissolved oxygen, sulfate plus chloride, pH. General criteria stating waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or unsightly or harmful bottom deposits or floating material.
- **Monitoring planned:** Numeric Criteria: Several streams in north Missouri below large Confined Animal Feeding Operations (CAFOs) are part of a fixed station monitoring network and are currently being monitored by DNR on a routine basis for ammonia and several other chemical analytes. If the current monitoring is insufficient to characterize ammonia and dissolved oxygen levels, additional monitoring sites will be added to sampling plan. DNR also plans to continue to monitor Sandy Creek at approximately three-year intervals within and downstream of the mine lands for pH, conductivity, temperature, sulfate plus chloride and total acidity. General Criteria: DNR will schedule a visual/benthic low flow survey in 2000 to assess compliance with general criteria.
- **Criteria for Compliance with Standards:** Chemical monitoring: Numeric Water Quality Standards for ammonia, dissolved oxygen, pH, sulfate plus chloride. General Criteria: Opinion of DNR/WPCP staff conducting visual/benthic low flow stream surveys.

13. Shoal Creek – Putnam County

- **Water Quality Concern:** Shoal Creek is a limited warm water fishery that may be impacted by animal waste and abandoned mine land (AML). Bacterial contamination and Atrazine have also been stated as a concern. It is not, however, classified for whole body contact recreation or as a drinking water supply. The standards, therefore, for bacteria and atrazine do not apply.
- **Applicable Standards:** Numeric criteria for ammonia, dissolved oxygen, sulfate plus chloride, pH. General criteria stating waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or unsightly or harmful bottom deposits or floating material.
- **Monitoring planned:** Numeric Criteria: Several streams in north Missouri below large Confined Animal Feeding Operations (CAFOs) are part of a fixed station monitoring network and are currently being monitored by DNR on a routine basis for ammonia and several other chemical analytes. If the current monitoring is insufficient to characterize ammonia and dissolved oxygen levels, additional monitoring sites will be added to sampling plan. DNR also plans to continue to monitor Shoal Creek at approximately three-year intervals within and downstream of the AML for pH, conductivity, temperature, sulfate plus chloride and total acidity. General Criteria: DNR will schedule a visual/benthic low flow survey to assess compliance with general criteria to be performed by DNR in 2000.
- **Criteria for Compliance with Standards:** Chemical Sampling: Numeric Water Quality Standards for ammonia, dissolved oxygen, pH, sulfate plus chloride. General Criteria: Opinion of DNR/WPCP staff conducting visual/benthic low flow stream surveys.

14. East Fork Long Branch – Sullivan/Linn Counties

- **Water Quality Concern:** East Fork Long Branch may not be meeting the numeric water quality standards for a limited warm-water fishery due to pollution from animal waste. Another concern is whether it meets the general criteria identified below.
- **Applicable Standards:** Numeric Criteria for ammonia, dissolved oxygen. General criteria stating waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or unsightly or harmful bottom deposits or floating material.
- **Monitoring planned:** Numeric Criteria: Several streams in north Missouri below large Confined Animal Feeding Operations (CAFOs) are part of a fixed station monitoring network and are currently being monitored by DNR on a routine basis for ammonia and several other chemical analytes. If the current monitoring is insufficient to characterize ammonia and dissolved oxygen levels, additional monitoring sites will be added to sampling plan. General Criteria: DNR will schedule a visual/benthic low flow survey to assess compliance with general criteria to be performed by DNR in 2000.
- **Criteria for Compliance with Standards:** Chemical Sampling: Missouri numeric Water Quality Standards for ammonia and dissolved oxygen. General Criteria: Opinion of DNR/WPCP staff conducting visual/benthic low flow stream surveys.

15. Bull Creek – Taney County

- **Water Quality Concern:** The concern on Bull Creek is the impact of sand and gravel mining operations and sedimentation. If not done properly, sand and gravel extraction can impair habitat for aquatic life. To date, the problem has not been adequately documented.
- **Applicable Standards:** General criteria stating waters shall be free from conditions harmful to aquatic life.
- **Monitoring Planned:** Fish and invertebrate community monitoring by DNR and MDC. The schedule for the DNR/MDC aquatic resources monitoring program has not been established. This stream will be a high priority for sampling early in the first three-year cycle, which begins in the fall of 2001 and ends in the spring of 2004. DNR cannot commit MDC to a sampling date in this MOA.
- **Criteria for Compliance with Standards:** Significant weight will be given to the DNR and MDC aquatic biologists determinations as to whether there are statistically significant impairments to the density and/or diversity of the fish or aquatic invertebrate communities. (Note: Biological criteria for aquatic invertebrates may be in state Water Quality Standards by the time this stream is sampled, and if so, Biocriteria would be used to determine impairment.)

16. Beaver Creek – Taney County

- **Water Quality Concern:** The concern on Beaver Creek is the impact of sand and gravel mining operations and sedimentation. If not done properly, sand and gravel extraction can impair habitat for aquatic life. To date, the problem has not been adequately documented.
- **Applicable Standards:** General criteria stating waters shall be free from conditions harmful to aquatic life.
- **Monitoring Planned:** Fish and invertebrate community monitoring by DNR and MDC. The schedule for the DNR/MDC aquatic resources monitoring program has not been established. This stream will be a high priority for sampling early in the first three-year cycle, which begins in the fall of 2001 and ends in the spring of 2004. DNR cannot commit MDC to a sampling date in this MOA.
- **Criteria for Compliance with Standards:** Significant weight will be given to the DNR and MDC aquatic biologists determinations as to whether there are statistically significant impairments to the density and/or diversity of the fish or aquatic invertebrate communities. (Note: Biological criteria for aquatic invertebrates may be in state Water Quality Standards by the time this stream is sampled, and if so, Biocriteria would be used to determine impairment.)

17. Swan Creek – Christian/Taney County

- **Water Quality Concern:** The concern on Swan Creek is the impact of sand and gravel mining operations and sedimentation. If not done properly, sand and gravel extraction can impair habitat for aquatic life. To date, the problem has not been adequately documented.
- **Applicable Standards:** General criteria stating waters shall be free from conditions harmful to aquatic life.

- **Monitoring Planned:** Fish and invertebrate community monitoring by DNR and MDC. The schedule for the DNR/MDC aquatic resources monitoring program has not been established. This stream will be a high priority for sampling early in the first three-year cycle, which begins in the fall of 2001 and ends in the spring of 2004. DNR cannot commit MDC to a sampling date in this MOA.
- **Criteria for Compliance with Standards:** Significant weight will be given to the DNR and MDC aquatic biologists determinations as to whether there are statistically significant impairments to the density and/or diversity of the fish or aquatic invertebrate communities. (Note: Biological criteria for aquatic invertebrates may be in state Water Quality Standards by the time this stream is sampled, and if so, Biocriteria would be used to determine impairment.)

18. Roark Creek – Taney County

- **Water Quality Concern:** The watershed of Roark Creek is undergoing intensive development. This increases the possibility Roark is being impaired by point source pollution and nonpoint source pollution, in the form of polluted runoff.
- **Applicable Standards:** General criteria stating waters shall be free from conditions harmful to aquatic life.
- **Monitoring Planned:** Fish and invertebrate community monitoring by DNR and MDC. The schedule for the DNR/MDC aquatic resources monitoring program has not been established. This stream will be a high priority for sampling early in the first three-year cycle, which begins in the fall of 2001 and ends in the spring of 2004. DNR cannot commit MDC to a sampling date in this MOA.
- **Criteria for Compliance with Standards:** Significant weight will be given to the DNR and MDC aquatic biologists determinations as to whether there are statistically significant impairments to the density and/or diversity of the fish or aquatic invertebrate communities. (Note: Biological criteria for aquatic invertebrates may be in state Water Quality Standards by the time this stream is sampled, and if so, Biocriteria would be used to determine impairment.)

19. Thompson River - Harrison/Grundy/Livingston Counties

- **Water Quality Concern:** Pollutants of concern in the entire length of the Thompson River are atrazine and animal waste. Existing data (69 observations from credible sources) have not shown the Thompson River to be impaired by triazine compounds. These compounds include cyanazine, simazine and atrazine.
- **Applicable Standards:** Numeric Criteria for general warm-water streams. Pollutants of concern are atrazine (as it applies to drinking water sources), ammonia and dissolved oxygen.
- **Monitoring Planned:** Numeric Criteria: Atrazine - Novartis and the DNR Public Drinking Water Program (PDWP) sample several times every year. This data will be reviewed biennially. Ammonia and Dissolved Oxygen - DNR maintains fixed station water quality monitoring sites on the Thompson River at Mt. Moriah and on the Grand River downstream of the Thompson River. These sites monitor for ammonia, dissolved oxygen and a wide variety of other water quality constituents.

- **Criteria for Compliance with Standards:** Missouri numeric Water Quality Standards for atrazine, ammonia and dissolved oxygen. The Atrazine standard is evaluated as the period of record mean atrazine concentration.

20. East Fork Locust Creek – Sullivan County

- **Water Quality Concern:** The concern on East Fork Locust Creek is two permitted discharges, the City of Milan and Premium Standard Foods. The City of Milan is in the process of upgrading their wastewater treatment facilities.
- **Applicable Standards:** Numeric Criteria for limited warm-water streams, specifically ammonia and dissolved oxygen. General criteria stating waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or unsightly or harmful bottom deposits or floating material.
- **Monitoring Planned:** DNR plans a water quality study of East Fork Locust Creek in the Milan area after the completion of the upgrade of the present WWTP. This study will gather data to evaluate general criteria and numeric criteria.
- **Criteria for Compliance with Standards:** Chemical Sampling – Missouri numeric Water Quality Standards for ammonia and dissolved oxygen. General Criteria - Opinion of DNR/WPCP staff conducting the visual/benthic low flow stream surveys.

21. McCarty Creek – Vernon County

- **Water Quality Concern:** The pollutants of concern on McCarty Creek are animal waste and sedimentation.
- **Applicable Standards:** Numeric Criteria for ammonia and dissolved oxygen. General criteria stating waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or unsightly or harmful bottom deposits or floating material.
- **Monitoring planned:** Numeric Criteria: Several streams in north and west Missouri below large Confined Animal Feeding Operations (CAFOs) are part of a fixed station monitoring network and are currently being monitored by DNR on a routine basis for ammonia and several other chemical analytes. If the current monitoring is insufficient to characterize ammonia and dissolved oxygen levels, additional monitoring sites will be added to sampling plan. General Criteria: DNR will schedule a visual/benthic low flow survey to assess compliance with general criteria to be performed by DNR in 2000.
- **Criteria for Compliance with Standards:** Chemical Sampling – Missouri numeric Water Quality Standards for ammonia and dissolved oxygen in limited warm-water streams. General Criteria - Opinion of DNR/WPCP staff conducting visual/benthic low flow stream surveys.

22. Willow Branch – Putnam County

- **Water Quality Concern:** The pollutants of concern on Willow Branch are animal waste and sedimentation.
- **Applicable Standards:** Numeric Criteria for ammonia and dissolved oxygen. General criteria stating waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or unsightly or harmful bottom deposits or floating material.

- **Monitoring Planned:** Specific Criteria: Several streams in north Missouri below large Confined Animal Feeding Operations (CAFOs) are part of a fixed station monitoring network and are currently being monitored by DNR on a routine basis for ammonia and several other chemical analytes. If the current monitoring is insufficient to characterize ammonia and dissolved oxygen levels, additional monitoring sites will be added to sampling plan. General Criteria: DNR will schedule a visual/benthic low flow survey to assess compliance with general criteria to be performed by DNR in 2000.
- **Criteria for Compliance with Standards:** Chemical Sampling – Missouri numeric Water Quality Standards for ammonia and dissolved oxygen in limited warm-water streams. General Criteria - Opinion of DNR/WPCP staff conducting visual/benthic low flow stream surveys.

23. West Locust Creek –Putnam/Sullivan Counties

- **Water Quality Concern:** The pollutants of concern on West Locust Creek are animal waste and sedimentation.
- **Applicable Standards:** Numeric Criteria for ammonia and dissolved oxygen. General criteria stating waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or unsightly or harmful bottom deposits or floating material.
- **Monitoring planned:** Specific Criteria: Several streams in north Missouri below large Confined Animal Feeding Operations (CAFOs) are part of a fixed station monitoring network and are currently being monitored by DNR on a routine basis for ammonia and several other chemical analytes. If the current monitoring is insufficient to characterize ammonia and dissolved oxygen levels, additional monitoring sites will be added to the sampling plan. General Criteria: DNR will schedule a visual/benthic low flow survey to assess compliance with general criteria to be performed by DNR in 2000.
- **Criteria for Compliance with Standards:** Chemical Sampling – Missouri numeric Water Quality Standards for ammonia and dissolved oxygen in limited warm-water streams. General Criteria - Opinion of DNR/WPCP staff conducting visual/benthic low flow stream surveys.

24. Locust Creek – Putnam/Sullivan Counties

- **Water Quality Concern:** The pollutants of concern on Locust Creek are animal waste and sedimentation.
- **Applicable Standards:** Numeric Criteria for ammonia and dissolved oxygen. General criteria stating waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or unsightly or harmful bottom deposits or floating material.
- **Monitoring planned:** Specific Criteria: Several streams in north Missouri below large Confined Animal Feeding Operations (CAFOs) are part of a fixed station monitoring network and are currently being monitored by DNR on a routine basis for ammonia and several other chemical analytes. If the current monitoring is insufficient to characterize ammonia and dissolved oxygen levels, additional monitoring sites will be added to sampling plan. General Criteria: DNR will schedule

a visual/benthic low flow survey to assess compliance with general criteria to be performed by DNR in 2000.

- **Criteria for Compliance with Standards:** Chemical Sampling – Missouri numeric Water Quality Standards for ammonia and dissolved oxygen in limited warm-water streams. General Criteria - Opinion of DNR/WPCP staff conducting visual/benthic low flow stream surveys.

25. Little Blue River – Jackson County

- **Water Quality Concern:** The Little Blue River was listed in error. The waterbody of concern was the Blue River, which is already on the 1998 303(d) list. As with all state waters, credible data available at the time of the next 303(d) listing cycle will be evaluated to determine if the Little Blue River is impaired.
- **Applicable Standards:** All applicable state numeric and general criteria.
- **Monitoring planned:** No additional monitoring is planned at this time.
- **Criteria for Compliance with Standards:** Meets water quality standards for designated uses of Protection of Warm Water Aquatic Life & Human Health-Fish Consumption and Livestock & Wildlife Watering.

26. W. Medicine Creek - Mercer/Grundy Counties

- **Water Quality Concern:** The pollutants of concern on Locust Creek are animal waste and sedimentation.
- **Applicable Standards:** Numeric Criteria for ammonia and dissolved oxygen. General criteria stating waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or unsightly or harmful bottom deposits or floating material.
- **Monitoring planned:** Numeric Criteria: Several streams in north Missouri below large Confined Animal Feeding Operations (CAFOs) are part of a fixed station monitoring network and are currently being monitored by DNR on a routine basis for ammonia and several other chemical analytes. If the current monitoring is insufficient to characterize ammonia and dissolved oxygen levels, additional monitoring sites will be added to sampling plan. General Criteria: DNR will schedule a visual/benthic low flow survey to be performed by DNR in 2000.
- **Criteria for Compliance with Standards:** Chemical Sampling – Missouri numeric Water Quality Standards for ammonia and dissolved oxygen in limited warm-water streams. General Criteria - Opinion of DNR/WPCP staff conducting visual/benthic low flow stream surveys.